

Hylebos Waterway Natural Resource Damage Settlement Proposal and Liability Allocation

The natural resource trustees conducting the natural resource damage assessment for the Commencement Bay environment consist of the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Dept. of Commerce (lead administrative trustee), the U.S. Dept. of the Interior, the Washington Dept. of Ecology (as lead state trustee, also representing the Washington Dept. of Natural Resources and Dept. of Fish and Wildlife), the Puyallup Tribe of Indians, and the Muckleshoot Indian Tribe.

Copies of the trustees' natural resource damage settlement proposal report for the Hylebos Waterway and supporting documents are available for review at two repositories:

Citizens for a Healthy Bay
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Email: lrose@healthybay.org

NOAA Damage Assessment and Restoration Center NW
7600 Sand Point Way NE
Seattle, WA 98115-0070
Contact: Gail Siani
Phone: 206/526-4566
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Persons wishing to review the documents are asked to phone or email in advance to make an appointment.

A copy of the report can also be downloaded at

www.darcnw.noaa.gov/hylsettl.htm

For more information contact
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Hazardous Chemical Contamination in Hylebos Waterway Sediments Injures Fish that Live In and Use the Area; Juvenile Salmon, Flatfish, Sediment Organisms and Habitats Harmed by Pollution

Studies by the trustees have shown that pollution in Hylebos Waterway has harmed the waterway sediments, the small organisms that live in and on the sediments, and the fish that prey on those organisms and come into contact with the pollution.

● Sediments, Sediment Organisms Harmed

In one early study, scientists tested sediments from 28 locations throughout the waterway. The investigators found elevated levels of hazardous chemicals at nearly every location. In laboratory tests the scientists found that the sediments from nearly two thirds of the locations caused problems for the small organisms that live in and on the sediments. Test organisms exposed to the contaminated sediments died or showed behavioral changes like reduced mobility or survival.

The scientists also compared the populations of sediment organisms found in the waterway to those found in similar, unpolluted areas. In over 90% of the waterway locations, there were fewer numbers of organisms, and fewer types of organisms, than in the unpolluted areas. These small organisms form the base of the food web that supports most of the Commencement Bay ecosystem. Changes or reductions in this food source consequently have effects at all levels in the ecosystem.

● Flatfish and juvenile salmon take up contaminants, show effects; flatfish reproduction impaired

The trustees have also conducted two rounds of studies of the effects of the contaminants on fish species that live in the Hylebos Waterway or that use it during important parts of their growth and development.

In the first study round, the scientists caught two types of juvenile salmon and two types of flatfish from the waterway and examined their stomach contents and body tissues. All the studied fish had elevated levels of waterway chemicals in their stomachs and in their tissues. This shows that the fish are taking up the chemicals from the waterway sediments in part by eating contaminated prey. The presence of the chemicals in tissues shows that the chemicals are not all passing through the fish but are being taken up in the bodies of the animals.

The scientists examined juveniles of two types of salmon that use the Hylebos Waterway, juvenile chinook, now listed under the Endangered Species Act, and juvenile chum. The studies found blood chemistry changes in the fish that show the fish is under stress as its body tries to handle the effects of the contamination. In the chum salmon the scientists also found increases in the occurrence of changes in the salmon's genetic material, which is a sign of damage to fish DNA from some contaminants.

Studies of English sole and rock sole, two types of flatfish that live in and use the Hylebos Waterway, found an increased occurrence of liver cancers and injuries to liver tissues that lead to the development of cancer. The flatfish also showed similar signs of chemical stress and genetic damage as were seen in the salmon.

Exposure to the waterway chemicals also affects flatfish reproduction. Flatfish caught in the Hylebos produce fewer eggs than flatfish from uncontaminated areas. The entire reproductive life cycle of the English sole appears impacted: the exposed fish tend to mature sexually at an earlier age, and to stop reproducing younger than in other areas. Because older fish tend to be bigger, and bigger fish tend to produce more eggs, the scientists believe that this shift in the reproductive cycle means that fewer eggs are produced over a fish's lifetime.

Commenting on the Proposal

Comments will be accepted through close of business **May 16, 2002**. Comments should be in writing and addressed to:

Hylebos NRDA Settlement Proposal Comments
Attn: Ms. Gail Siani
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Center NW
7600 Sand Point Way NE
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or by email to
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● Juvenile Chinook Salmon Show Immune System Impairment and Growth Reduction

In the second study round, scientists injected juvenile chinook salmon from hatcheries with different mixtures of pollutants of the type found in the Hylebos. The studies showed that exposure to a variety of contaminants affects the chinook's immune system. After they are exposed to the chemicals, the fish tend to succumb to disease more quickly than unexposed fish.

Exposure to contaminants also interferes with growth in juvenile chinook salmon. Exposed fish grow more slowly than unexposed fish. Reduced growth potentially can reduce the rate of survival for the smaller fish. Many biologists believe that the size of juvenile salmon at different stages of development is extremely important because the salmon encounter different sized prey at different times. Also, smaller fish tend to be slower and more at risk from being eaten by larger fish or birds.

● Contamination and Its Impacts Continue After Exposure Ends

Chinook salmon are exposed to Hylebos Waterway contaminants for only a small portion of their lives. However, the effects of the pollution come at sensitive points in the fish's growth and development and can be long-lasting. The trustees' studies also found some contaminants and their effects present as much as 60 days after the fish received a single dose of the chemicals.

For more information on the trustees' injury studies, including copies of study reports, see the NOAA website at www.darcnw.noaa.gov/cb.htm and follow the links to the Commencement Bay injury investigations.